0062370

VALIDATION REPORT

SAF NUMBER F03-006

SDG NUMBER H2329

_____ DRAFT

X FINAL

ORP-114 (02/02)

ORP - REVIEW COMMENT RECORD (RCR)

"Workcopy"

1. Date	2. Review No.
January 9, 2004	N/A
3. Project No.	4. Page 1 of 2
200-PW-2	

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Package H2329	Groundwater Protection Program/200-PW-2	Doris Ayres	EIS Sample Management	A0-21 373-5582

17. Comment Submittal Approval	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (optional)	1/28/04 Date; Doris E Ayres Reviewer/Point of Contact; Requester	1-28-04 Date; Doris E Ayres Reviewer/Point of Contact; Requester

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
1	Radiochemistry - Page 3; Field duplicates - you say all field duplicate results are acceptable, but you do not identify which samples are the field duplicates.		Accepted, Field dup will be identified. B173W6	✓
2	Radiochemistry - Why was sample B173W6 not validated? Please be sure to include the appropriate chain of custody documents in the report.		Sample B173W6 was not validated because it was not included in the work request.	✓
3	Radiochemistry - Laboratory QC sheets need to be included (pages 11 -16 of original data package).		Rejected. This request will be accommodated on future data val. rpts.	✓
4	Pesticides - Page 1; In the header and the introduction, the SDG number is H2329. The "C" is added to the scanned data by sample management so the client can find data more easily. Please remove the "C".		Accepted	✓
5	General Chemistry - Page 1; In the header and the introduction, the SDG number is H2329. The "C" is added to the scanned data by sample management so the client can find data more easily. The introduction is confusing, but so is the package. The laboratory submitted 2 Inorganics sections - one covering 1 sample and the second one covering the remaining 10 samples. Please replace the introduction with one similar to the Radiochemistry introduction.		The "C"s will be removed. The 2nd sentence in 1st paragraph will be removed. The correct, merged narrative matrix will be added if available	✓
6	General Chemistry - Why was sample B173W6 not validated? It was in scanned file H2329C. The samples that were validated were in scanned file H2329C2.		Sample B173W6 was not validated because it was not included in the work request.	✓

ORP-114 (02/02)

ORP - REVIEW COMMENT RECORD (RCR) (continued)

1. Date	2. Review No.
January 9, 2004	N/A
3. Project No.	4. Page 2 of 2
200-PW-2	

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
7	General Chemistry - Page 13. This is the narrative from scanned file H2329C. The narrative from scanned file H2329C2 needs to be included. In addition please be sure that the appropriate chains of custody are included. Sample Management is aware that the Case Narrative in scanned file H2329C2 is not signed. We have requested a signed copy from the laboratory.		The correct narrative will be used. A signed one will be used, if available.	✓

ORP-114 (02/02)

ORP - REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
Dec 9, 2003	N/A
3. Project No.	4. Page 1 of 2
200-PW-2 & 4	

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Data Package SDG H2329	Groundwater Protection program/200-PW-2 & 4 OU	Bill Thackaberry	Env & Science Assurance (QA)	E6-35 372-0742

17. Comment Submittal Approval	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (optional)	WR Thackaberry Reviewer/Point of Contact	WR Thackaberry Reviewer/Point of Contact
	2-5-04 Date	2-5-04 Date
	Requester	Requester

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
1	Chlorinated Herbicides Analysis - pgs 18-21, The validator failed to circle N/A in numerous places where it should have been circled.		N/A's circled	✓
2	Chlorinated Herbicides Analysis, Pages 9-22, please discourage the validator from submitting reduced size data sheets.		Attachments will be enlarged	✓
3	Chlorinated Herbicides Analysis - pg 20, The validator failed to answer the questions regarding hold times.		Checklist completed	✓
3	General Chemistry - pg ~~30~~ 3, Analytical Detection Limits, "Nitrate/nitrite limits were commiserate with those limits..." Should this be commensurate?		Yes. Changed.	✓
4	General Chemistry - pgs 10-11, not legible.		Attachments will be enlarged	✓
5	General Chemistry- pgs 19-22, The validator failed to circle N/A in numerous places where it should have been circled.		N/A's circled	✓
6	Pesticide Analysis - Pages 10-25, please discourage the validator from submitting reduced size data sheets.		Attachments will be enlarged	✓
7	Pesticide Analysis - Pages 22-25, The validator failed to circle N/A in numerous places where it should have been circled.		N/A's circled	
8	Radiochemistry - pg 30 Checklist item 7 incomplete.		Checklist completed	✓

ORP-114 (02/02)

ORP - REVIEW COMMENT RECORD (RCR) (continued)

1. Date	2. Review No.
Dec 9, 2003	N/A
3. Project No.	4. Page 2 of 2
200-PW-2 & 4	

12. Item	13a. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted). Provide separate attachments if necessary.	16. Status
9	Radiochemistry - pg 31 Checklist item 9 incomplete.		Checklist completed	✓
10	Radiochemistry - pg 32 Checklist item 11 incomplete.		" "	✓
11	Radiochemistry - pgs 10-33 please discourage the validator from submitting reduced size data sheets.		Attachments will be enlarged	✓

Date: 12/12/03
To: Fluor Hanford
From: EQM, Inc.
Project: 200 Area Source Characterization 200-PW-2 & 4 Operable Unit
Subject: Pesticides Analysis-Data Package SDG H2329

INTRODUCTION

This memo presents the results of Data Validation on Data Package SDG H2329 prepared by Lionville Laboratory, Inc. (LLI) for Pesticides. A list of samples validated along with the analysis reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B17HR9	9/3/03	Soil	C	8081& extraction 3540
B17HX4	9/3/03	Soil	C	8081& extraction 3540
B17HX8	9/3/03	Soil	C	8081& extraction 3540
B17HX9	9/3/03	Soil	C	8081& extraction 3540
B17HY4	9/4/03	Soil	C	8081& extraction 3540
B17J02	9/3/03	Soil	C	8081& extraction 3540

Note that of the 10 samples submitted, pesticides were requested on six samples.

Data validation was conducted in accordance with the BHI Validation Procedure for Chemical Analysis, BHI-01435, and Sampling and Analysis Plan, DOE/RL-2000-60, Rev. 1. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifiers
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain of Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by the Client (not applicable)

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for Pesticides Analysis is 14 days to extraction and 40 days to analysis.

  All holding times were met.

- **Method Blanks**

  At least one method blank per analytical batch of samples was analyzed. It consisted of deionized distilled water and was processed through each set of the sample preparation and analysis procedure.

  All method blanks fell within acceptable limits.

- **Field Blanks**

  No field blanks were submitted for analysis.

- **Accuracy**

  Matrix spike analyses were used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spikes must be analyzed at least once per batch of samples, using the same procedures as samples and added as early in the sample preparation process as possible.

  Matrix spike recoveries must fall within the range of 50-150% per BHI-01435. No MS recoveries were specified in the SAP.

  The matrix spike and matrix spike duplicate for sample B17HR9 were out of control limits for delta-BHC, Endosulfan Sulfate and Endrin Aldehyde.

- **Surrogates**

  Surrogate recovery for sample B17HR9 is outside of control limits of 50-150%.

  Sample is flagged with "UJ".

- **Laboratory Control Samples (LCS)/Blank Spike Sample (BSS)**

  BSS /LCS are also a measure of accuracy. Blank spikes or LCS recoveries must be within 50-150%.

  BSS was out of control for delta-BHC, endosulfan sulfate and endrin aldehyde. All associated samples must be flagged with a "UJ" for those compounds.

- **Precision**

  Matrix Spike/Spike Duplicate

  Matrix spike duplicate samples are used to measure laboratory precision and sample homogeneity. Results must be within a relative percent difference (RPD) of $\leq 35\%$ for non-aqueous samples that have a concentration of >5 times the RDL.

  % RPD for sample B17HR9 is out of control for endosulfan sulfate.

  Samples do not need to be flagged because they are all non-detects; however, they have already been flagged for other reasons (see previous sections).

  Field Duplicate Samples

  No field duplicate samples were analyzed for pesticides in this SDG.

- **Analytical Detection Limits**

  No pesticide reporting limits are presented in the SAP.

  All required detection limits were met.

- **Completeness**

  The data package for SDG: H2329 was submitted for validation and verified for completeness. Completeness was based on the number of data determined to be valid.

  The completeness percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

See matrix spike, blank spike and precision sections.

REFERENCES

BHI 01435. Rev 0, Validation Procedure for Chemical Analysis

DOE-RL2000-60, Rev. 1 (redline version 4/23/03), Uranium-Rich/General Process Condensate and Process Waste Group Operable Units RI/FS Work Plan and RCRA TSD Unit Sample Plan-Includes 200-PW-2 and 200-PW-4 Operable Units.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI 01435 and BHI 01433.

U - Indicates the compound or analysis was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data was usable for decision making purposes.

J – Indicates the compound or analyte was analyzed and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data was usable for the decision making purposes.

BJ – Applied to inorganic analyses only. Indicates that the analyte concentration is Greater than the IDL but less than the CRDL and is considered an estimate.

R – Indicates the compound or analyte was analyzed for, detected and due to identified major QC deficiency, the data are unusable.

UR – Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to a major QC deficiency.

NJ – Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e. usable for decision making purposes).

N – Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e. usable for decision making purposes).

Appendix 2

Summary of Data Qualifiers

DATA QUALIFICATION SUMMARY

SDG: H2329C	REVIEWER: MAH/MSM	DATE: 11/18/03, 11/22/03	PAGE 1 OF 1
COMMENTS:			
SAMPLES AFFECTED	**QUALIFIER**	**COMPOUND**	**REASON**
B17HR9	UJ	All	Surrogate
B17HR9 B17HX4 B17HX8 B17HX9 B17HY4 B17J02	UJ	Delta BHC Endosulfan sulfate Endrin aldehyde	Matrix Spike Blank spike

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Lionville Laboratory, Inc.
Pesticide/PCBs by GC, CLP List
Report Date: 09/30/03 13:47

RFW Batch Number: 0309L404 Client: TNUHANFORD F03-006 K2329 Work Order: 11343606001 Page: 1

	Cust ID:	B17HR9		B17HR9		B17HR9		B17HX4		B17HX8		B17HX9	
Sample Information	RFW#:	001		001 MS		001 MSD		004		007		008	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate: Tetrachloro-m-xylene		40	%	80	%	90	%	85	%	90	%	90	%
Decachlorobiphenyl		45	%	95	%	105	%	95	%	95	%	95	%
Alpha-BHC		1.8	U	70	%	80	%	1.8	U	1.9	U	1.9	U
Beta-BHC		1.8	U	50	* %	60	* %	1.8	U	1.9	U	1.9	U
Delta-BHC		1.8	U	15	* %	15	* %	1.8	U	1.9	U	1.9	U
gamma-BHC (Lindane)		1.8	U	70	%	55	%	1.8	U	1.9	U	1.9	U
Heptachlor		1.8	U	85	%	95	%	1.8	U	1.9	U	1.9	U
Aldrin		1.8	U	70	%	75	%	1.8	U	1.9	U	1.9	U
Heptachlor epoxide		1.8	U	80	%	90	%	1.8	U	1.9	U	1.9	U
Endosulfan I		1.8	U	115	%	125	%	1.8	U	1.9	U	1.9	U
Dieldrin		3.6	U	90	%	100	%	3.6	U	3.7	U	3.7	U
4,4'-DDE		3.6	U	110	%	110	%	3.6	U	3.7	U	3.7	U
Endrin		3.6	U	110	%	125	%	3.6	U	3.7	U	3.7	U
Endosulfan II		3.6	U	65	* %	70	%	3.6	U	3.7	U	3.7	U
4,4'-DDD		3.6	U	80	%	95	%	3.6	U	3.7	U	3.7	U
Endosulfan sulfate		3.6	U	30	* %	70	%	3.6	U	3.7	U	3.7	U
4,4'-DDT		3.6	U	80	%	95	%	3.6	U	3.7	U	3.7	U
Methoxychlor		18	U	115	%	135	* %	18	U	19	U	19	U
Endrin ketone		3.6	U	75	%	85	%	3.6	U	3.7	U	3.7	U
Endrin aldehyde		3.6	U	I	%	I	%	3.6	U	3.7	U	3.7	U
alpha-Chlordane		1.8	U	115	%	125	%	1.8	U	1.9	U	1.9	U
gamma-Chlordane		1.8	U	85	%	95	%	1.8	U	1.9	U	1.9	U
Toxaphene		180	U	360	U	360	U	180	U	190	U	190	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory, Inc.
Pesticide/PCBs by GC, CLP List
Report Date: 09/30/03 13:47

RFW Batch Number: 0309L404 Client: TNURANFORD F03-005 H2329 Work Order: 11343606001 Page: 2

	Cust ID:	B17HY4	B17J02	PBLKBT	PBLKBT BS
Sample Information	RFW#:	009	010	03LB1103-MB1	03LB1103-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG

Surrogate:			fl		fl		fl		fl
Tetrachloro-m-xylene	90	%	90	%	95	%	95	%	
Decachlorobiphenyl	95	%	95	%	110	%	110	%	

Alpha-BHC	1.8	U		1.8	U		1.7	U	70		%	
Beta-BHC	1.8	U		1.8	U		1.7	U	80		%	
Delta-BHC	1.8	U	UJ	1.8	U	UJ	1.7	U	10	*	%	
gamma-BHC (Lindane)	1.8	U		1.8	U		1.7	U	55		%	
Heptachlor	1.8	U		1.8	U		1.7	U	95		%	
Aldrin	1.8	U		1.8	U		1.7	U	80		%	
Heptachlor epoxide	1.8	U		1.8	U		1.7	U	90		%	
Endosulfan I	1.8	U		1.8	U		1.7	U	145	*	%	
Dieldrin	3.5	U		3.7	U		3.3	U	100		%	
4,4'-DDE	3.5	U		3.7	U		3.3	U	140	*	%	
Endrin	3.5	U		3.7	U		3.3	U	125		%	
Endosulfan II	3.5	U		3.7	U		3.3	U	90		%	
4,4'-DDD	3.5	U		3.7	U		3.3	U	70		%	
Endosulfan sulfate	3.5	U	UJ	3.7	U	UJ	3.3	U	20	*	%	
4,4'-DDT	3.5	U		3.7	U		3.3	U	60		%	
Methoxychlor	18	U		18	U		17	U	125		%	
Endrin ketone	3.5	U		3.7	U		3.3	U	90		%	
Endrin aldehyde	3.5	U	UJ	3.7	U	UJ	3.3	U	40	*	%	
alpha-Chlordane	1.8	U		1.8	U		1.7	U	125		%	
gamma-Chlordane	1.8	U		1.8	U		1.7	U	95		%	
Toxaphene	180	U		180	U		170	U	170	U		

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

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3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 1343-06-01

Case No.: TNUHANFORD F03-006 H2329 RFW Lot No.: 0309L404-001

MATRIX Spike - Sample No.: H17HR9 Level: (low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
Alpha-BHC	14.4	0	10.1	70	70 -130
Beta-BHC	14.4	0	7.22	50 *	70 -130
Delta-BHC	14.4	0	2.16	15 *	70 -130
gamma-BHC (Lindane)	14.4	0	10.1	70	30 -125
Heptachlor	14.4	0	12.3	85	37 -126
Aldrin	14.4	0	10.1	70	27 -133
Heptachlor epoxide	14.4	0	11.5	80	70 -130
Endosulfan I	14.4	0	16.6	115	70 -130
Dieldrin	14.4	0	13.0	90	40 -125
4,4'-DDE	14.4	0	15.9	110	70 -130
Endrin	14.4	0	15.9	110	45 -130
Endosulfan II	14.4	0	9.38	65 *	70 -130
4,4'-DDD	14.4	0	11.5	80	70 -130
Endosulfan sulfate	14.4	0	4.33	30 *	70 -130
4,4'-DDT	14.4	0	11.5	80	33 -123
Methoxychlor	14.4	0	16.6	115	70 -130
Endrin ketone	14.4	0	10.8	75	70 -130
Endrin aldehyde	14.4	0	0	I	70 -130
alpha-Chlordane	14.4	0	16.6	115	70 -130
gamma-Chlordane	14.4	0	12.3	85	70 -130

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Alpha-BHC	14.4	11.5	80	13	20	70 -130
Beta-BHC	14.4	8.66	60 *	18	20	70 -130
Delta-BHC	14.4	2.16	15 *	0	20	70 -130
gamma-BHC (Lindane)	14.4	7.94	55	24	50	30 -125
Heptachlor	14.4	13.7	95	11	31	37 -126
Aldrin	14.4	10.8	75	6	43	27 -133
Heptachlor epoxide	14.4	13.0	90	11	20	70 -130
Endosulfan I	14.4	18.0	125	8	20	70 -130
Dieldrin	14.4	14.4	100	10	38	40 -125
4,4'-DDE	14.4	15.9	110	0	20	70 -130
Endrin	14.4	18.0	125	12	45	45 -130
Endosulfan II	14.4	10.1	70	7	20	70 -130
4,4'-DDD	14.4	13.7	95	17	20	70 -130
Endosulfan sulfate	14.4	10.1	70	80 *	20	70 -130
4,4'-DDT	14.4	13.7	95	17	50	33 -123
Methoxychlor	14.4	19.5	135 *	16	20	70 -130
Endrin ketone	14.4	12.3	85	12	20	70 -130
Endrin aldehyde	14.4	0	I	0	20	70 -130
alpha-Chlordane	14.4	18.0	125	8	20	70 -130
gamma-Chlordane	14.4	13.7	95	11	20	70 -130

Column to be used to flag recovery and RPD values with an asterisk

3F

SOIL PESTICIDE MATRIX SPIKE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 1343-06-01

Case No.: TNDHANFORD F03-006 H2329 RFW Lot No.: 0309L404

MATRIX Spike - Sample No.: PBLKETLE1103-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC	#	QC LIMITS REC
Alpha-BHC	6.67	0	4.67	70		70 -130
Beta-BHC	6.67	0	5.33	80		70 -130
Delta-BHC	6.67	0	0.667	10	*	70 -130
gamma-BHC (Lindane)	6.67	0	3.67	55		30 -125
Heptachlor	6.67	0	6.33	95		37 -126
Aldrin	6.67	0	5.33	80		27 -133
Heptachlor epoxide	6.67	0	6.00	90		70 -130
Endosulfan I	6.67	0	9.67	145	*	70 -130
Dieldrin	6.67	0	6.67	100		40 -125
4,4'-DDE	6.67	0	9.33	140	*	70 -130
Endrin	6.67	0	8.33	125		45 -130
Endosulfan II	6.67	0	6.00	90		70 -130
4,4'-DDD	6.67	0	4.67	70		70 -130
Endosulfan sulfate	6.67	0	1.33	20	*	70 -130
4,4'-DDT	6.67	0	4.00	60		33 -123
Methoxychlor	6.67	0	8.33	125		70 -130
Endrin ketone	6.67	0	6.00	90		70 -130
Endrin aldehyde	6.67	0	2.67	40	*	70 -130
alpha-Chlordane	6.67	0	8.33	125		70 -130
gamma-Chlordane	6.67	0	6.33	95		70 -130

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 5 out of 20 outside limits

COMMENTS:

Appendix 4

Laboratory Narrative and Chain of Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006
LVL #: 0309L404
SDG/SAF #: H2329/F03-006

W.O. #: 11343-606-001-9999-00
Date Received: 09-06-03

PESTICIDE

The set of samples consisted of six (6) soil samples collected on 09-03,04-03.

The samples and their associated QC samples were extracted on 09-09-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 09-26-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8081A.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. The samples and their associated QC samples received a Sulfur cleanups.

4. The method blank was below the reporting limits for all target compounds.

5. All surrogate recoveries were within acceptance criteria.

6. Five (5) of twenty (20) blank spike recoveries were outside acceptance criteria.

   Seven (7) of forty (40) matrix spike recoveries were outside acceptance criteria.

   Insufficient control data was collected to establish control limits. The defaulted detection limits of 70-130% are used for the acceptance criteria. Copies of the form 3F are included in this report.

   A copy of the Sample Discrepancy Report (SDR) has been enclosed.

7. All initial calibrations associated with this data set were within acceptance criteria.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

2

8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria with the exception of the target compounds listed on the calibration verification summaries included in this report. No target compounds were found in these samples.

No closing continuing calibration verification (CCV) standards were collected due to instrument failure. The surrogate recoveries were within acceptance criteria indicating no drop in instrument response, so the ability to detect the target compounds was not affected.

A copy of the SDR has been enclosed.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/1/3
Date

pdfs:\group\data\post\tsu hanford\09L-404.pes

Lionville Laboratory Use Only

03096404

Custody Transfer

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LIONVILLE LABORATORY INC.

Client: TNU Hanford F03-006

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Odette Johnson

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 9-6-03 Date Due: 10-6-03

		A	B					C	D	E
Refrigerator #		4	L						1	4
#/Type Container	Liquid									
	Solid	1eg	1eg					1eg	1eg	1eg
Volume	Liquid									
	Solid	60	250					125	60	125
Preservatives		—	—					—	—	—
ANALYSES REQUESTED →	ORGANIC: VOA, BNA	Pest/PCB	Herb		INORG: Metal	CN		Hex Chrom	NO2/NO3	Oil + Grease
Lionville Laboratory Use Only		0608H	0H36X					ICR6	IN3N2	IOGGR

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	Pest/PCB	Herb	Hex Chrom	NO2/NO3	Oil + Grease
001	B17HR9			S	9-3-03	0841	X	X	X	X	X
002	B17HT0			↓	↓	0857			X	X	X
003	B17HT1					1350			X	X	X
004	B17HX4					0920	X	X	X	X	X
005	B17HX5					0930			X	X	X
006	B17HX6				9-4-03	1025			X	X	X
007	B17HX8				9-3-03	1000	X	X	X	X	X
008	B17HX9				↓	1030	X	X	X	X	X
009	B17HY4				9-4-03	1240	X	X	X	X	X
010	B17J02			↓	9-3-03	1000	X	X	X	X	X

Special Instructions: SAF # F03-006

Run Matrix QC

DATE/REVISIONS:

→ 1. Did not receive volume for
2. Pest, Herb + O+G analysis for
sample 010
4.
5.
6.

Lionville Laboratory Use Only

Samples were: ✓
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.8 °C

Relinquished by	Received by	Date	Time
[signature]	[signature]	9-6-03	1025

Relinquished by	Received by	Date	Time
"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7914 9192 7033

17

18

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-242	Page 1 of 1

Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom; Telephone No. 373-3928	Project Coordinator: TRENT, SJ	Price Code 8N; Data Turnaround 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin — C413	SAF No. F03-006	Air Quality ☐
Ice Chest No. SEE OSR	Field Logbook No. HNF-N-3361; COA 117504ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA) RECRA	Offsite Property No. A030 346	Bill of Lading/Air Bill No. SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A Tie To 200 B17T00

Special Handling and/or Storage
N/A Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL			
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) in Special Instructions	Tritium - H3			

Sample No.	Matrix *	Sample Date	Sample Time										
B17HR9	SOIL	9-3-03	0841	X	X	X	X	X	X	X			
B17HT0	SOIL	9-3-03	0857			X	X	X					
B17HT1	SOIL	9-3-03	1350			X	X	X					
~~B17HT2~~	~~SOIL~~	~~9-3-03~~	MD 9-4			~~X~~	~~X~~	~~X~~					

TMD 9-3-03; TMD; MD

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	9-3-03 1500	MO-026 Ref#1	9-3-03 1500
MO-026 Ref#1	9-4-03 1400	[signature]	9-4-03
[signature]	9-4-03 1430	Ref #3C	9-4-03 1430
3C 3728	9-5-03 1040	R. Fahlberg	9-5-03
R. Fahlberg	9-5-03 1005	Fed Ex	
Fed Ex	9-6-03/1025	[signature]	9-6-03/10:25

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728 Ref # 3C on 9/5/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

FH-Central Plateau Project

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom; Telephone No.: 373-3928	Project Coordinator: TRENT, SJ	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin - C4114	SAF No.: F03-006	Air Quality ☐
Ice Chest No.: SEE OSRC	Field Logbook No.: HNF-N-3361; COA: 117504ES10	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ TMD 9-3-03 Recra	Offsite Property No.: A030 346	Bill of Lading/Air Bill No.: SEE OSRC	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A Ti-To B17J00

Special Handling and/or Storage
N/A cool/4C

			Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None
			Type of Container	aG	aG	aG	aG	aG	aG	aG
			No. of Container(s)	1	1	1	1	1	1	1
			Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL
SAMPLE ANALYSIS				Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) in Special Instructions	Tritium - H3
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**							
B17HX4	SOIL	9-3-03	0920	X	X	X	X	X		
B17HX5	SOIL	9-3-03	0930			X	X	X		
B17HX6	SOIL	9-4-03 ~~9-3-03~~	1025			X	X	X		
~~B17HX7~~	~~SOIL~~	~~9-3-03~~				X	X	X		
~~B17J02~~	~~SOIL~~	~~9-3-03~~						X		

Handwritten corrections: TMD 9-3-03; TMD 9-4-03; TMD 9-3-03

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible signature]	9-3-03 1500	MO-032 REF #1	9-3-03 1500
MO-032 REF #1	9-4-03 1400	[illegible signature]	9-4-03 1400
[illegible signature]	9-4-03 1420	REF #3C	9-4-03 1420
3C 3728	9-5-03 1000	[illegible signature]	9-5-03 1000
ERC [illegible signature]	9-5-03 1000	Fed Ex	
Fed Ex	9-6-03/1025	[illegible signature]	9-6-03/1025

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the rad characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728
Ref # 3C on 9/5/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title		Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time

BHI-EE-011 (03/01/2002)

F03-006-245

FH-Central Plateau Project — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom — Telephone No. 373-3928	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin - C4115	SAF No. F03-006	Air Quality ☐
Ice Chest No. SEE OSPC	Field Logbook No. HNF-N-3361 — COA 117504ES10	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ Rocra TMJ 9-4-03	Offsite Property No. A030346	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A Tie to B17J00

Special Handling and/or Storage
N/A Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None				
Type of Container	aG	aG	aG	aG	aG	aG	aG				
No. of Container(s)	1	1	1	1	1	1	1				
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL				
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) in Special Instructions	Tritium - H3				

Sample No.	Matrix *	Sample Date	Sample Time	Pesticides	Chloro-Herbicides	Chromium Hex	NO2/NO3	Oil & Grease	Item (1)	Tritium			
B17HX8	SOIL	9-3-03	1000	X	X	X	X	X					
B17HX9	SOIL	9-3-03	1030	X	X	X	X	X					
B17HY4	SOIL	9-4-03	1240	X	X	X	X	X					
~~B17HY5~~	~~SOIL~~ TMJ 9-4-03												
B17J02	Soil	9-3-03	1000	X	X	X	X	X					

(Item (1) and Tritium columns lined out: TMJ 9-4-03)

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible signature]	9-3-03	[illegible] LOT #1	9-3-03 1500
[illegible] LOT #1	9-4-03 1400	[illegible signature]	9-4-03 1400
[illegible signature]	9-4-03 1430	Ref #3C	9-4-03 1430
3C 3728	9-5-03 1000	R. [illegible]	9-5-03 1000
[illegible]	9-5-03 1000	FedEx	
[illegible]	9-6-03/1025	[illegible signature]	9-6-03/1025

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the rad characteristics.

(1) ~~Technetium-99; Strontium-89,90 – Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237.~~ TMJ 9-4-03

Personnel not available to relinquish samples from the 3728 Ref # 3C on 9-5-03

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title		Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By		Date/Time

BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200 Area			DATA PACKAGE: 42329 C		
VALIDATOR: Hall		LAB: Kimmerville		DATE: 11/18/03	
CASE:			SDG: 42329 C		
ANALYSES PERFORMED					
SW-846 8081 A Extraction 3540	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... (Yes) No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

DDT and endrin breakdowns acceptable? ..... Yes No (N/A)

Comments: _____

PESTICIDE/PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No (N/A)
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... (Yes) No N/A
Surrogate recoveries acceptable? ..... Yes (No) N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... Yes (No) N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes No (N/A)
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: BSS out of control for d-BHC, endosulfan sulfate & endrin aldehyde.
Surrogates for sample 0517HR9 are out of control likewise.
Sample needs to be qualified with a "UJ"

PESTICIDE/PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? .... (Yes) No N/A

Duplicate results acceptable? .... Yes (No) N/A

MS/MSD standards NIST traceable? (Levels D, E) .... Yes No (N/A)

MS/MSD standards expired? (Levels D, E) .... Yes No (N/A)

Field duplicate RPD values acceptable? .... Yes No (N/A)

Field split RPD values acceptable? .... Yes No (N/A)

Transcription/calculation errors? (Levels D, E) .... Yes No (N/A)

Comments: Sample B17HR9 MS fell outside of QC limits for B-BHC, d-BHC, Endosulfan II, Endosulfan sulfite and Endrin aldehyde.
%RPD was outside control limits for ~~endrin~~ endosulfan sulfate

4/28/04 Daryl per phone conversation with M. Hull of EON

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? .... Yes No (N/A)

Positive results resolved acceptably? .... Yes No (N/A)

Comments:

7. HOLDING TIMES (all levels)

Samples properly preserved? .... (Yes) No N/A

Sample holding times acceptable? .... (Yes) No N/A

Comments:

PESTICIDE/PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No (N/A)
Compound quantitation acceptable? (Levels D, E) ..... Yes No (N/A)
Results reported for all requested analyses? ..... (Yes) No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)
Samples properly prepared? (Levels D, E) ..... Yes No (N/A)
Detection limits meet RDL? ..... (Yes) No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: NO Report list in SAP MM

9. SAMPLE CLEANUP (Levels D and E)

Florisil ® (or other adsorbant) cleanup performed? ..... Yes No (N/A)
Lot check performed? ..... Yes No (N/A)
Check recoveries acceptable? ..... Yes No (N/A)
GPC cleanup performed? ..... Yes No (N/A)
GPC check performed? ..... Yes No (N/A)
GPC check recoveries acceptable? ..... Yes No (N/A)
GPC calibration performed? ..... Yes No (N/A)
GPC calibration check performed? ..... Yes No (N/A)
GPC calibration check retention times acceptable? ..... Yes No (N/A)
Check/calibration materials traceable? ..... Yes No (N/A)
Check/calibration materials Expired? ..... Yes No (N/A)
Analytical batch QC given similar cleanup? ..... Yes No (N/A)
Transcription/Calculation Errors? ..... Yes No (N/A)
Comments:

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Comments:

Date: 11/19/03
To: Fluor Hanford
From: EQM, Inc.
Project: 200 Area Source Characterization 200-PW-2 & 4 Operable Unit
Subject: Chlorinated Herbicides Analysis-Data Package SDG H2329

INTRODUCTION

This memo presents the results of Data Validation on Data Package SDG H2329 prepared by Lionville Laboratory, Inc. (LLI) for Chlorinated Herbicides. A list of samples validated along with the analysis reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B17HR9	9/3/03	Soil	C	8151A
B17HX4	9/3/03	Soil	C	8151A
B17HX8	9/3/03	Soil	C	8151A
B17HX9	9/3/03	Soil	C	8151A
B17HY4	9/4/03	Soil	C	8151A
B17J02	9/3/03	Soil	C	8151A

Note that out of 10 samples submitted, herbicides were requested on six.

Data validation was conducted in accordance with the BHI Validation Procedure for Chemical AnalysisBHI-01435 and Sampling and Analysis Plan, DOE/RL-2000-60, REV1. Note that no herbicide analyses were specified in the SAP, thus the default limits from the BHI-01435 were used for validation. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifiers
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain of Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by the Client- not applicable

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for Pesticides Analysis is 14 days to extraction and 40 days to analysis.

  All holding times were met.

- **Method Blanks**

  At least one method blank per analytical batch of samples was analyzed. It consisted of deionized distilled water was processed through each set of the sample preparation and analysis procedure.

  All method blanks fell within acceptable limits.

- **Field Blanks**

  No field blanks were submitted for analysis.

- **Accuracy**

  Matrix spike analyses were used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spikes must be analyzed at least once per batch of samples, using the same procedures as samples and added as early in the sample preparation process as possible.

  Matrix spike recoveries must fall within the range of 50-150%.

  Sample B17HX8 is outside of control limits for dicamba, 2,4,5T, 2,4-DB, and dalapon, and needs to be flagged with "UJ". Based on the supporting information to the case narrative only the sample spiked was flagged.

  Surrogate Recovery

  Surrogates are also used to assess the accuracy of the method. Surrogate recoveries should be between 50 and 150%.

  Surrogate recovery for sample B17HR9 is out of control and the sample needs to be flagged with "UJ".

- **Laboratory Control Samples (LCS)/Blank Spike Sample (BSS)**

  BSS / LCSs are also a measure of accuracy. Blank spikes or LCS recoveries must be within 50-150%.

  All BSS met acceptable limits.

- **Precision**

  Matrix Spike Duplicates

  Matrix spike duplicate samples are used to measure laboratory precision and sample homogeneity. Results must be within a relative percent difference (RPD) of $\leq 35\%$ for non-aqueous samples that have a concentration of >5 times the RDL.

  The matrix spike duplicate requirements were met for all analytes.

  Field Duplicate Samples

  No field duplicate samples were analyzed for herbicides in this SDG.

- **Analytical Detection Limits**

  No reporting limits were presented in the Sampling & Analysis Plan, DOE/RL-2000-60, Rev 1.

  All required detection limits were met.

- **Completeness**

  The data package for SDG: H2329 was submitted for validation and verified for completeness. Completeness was based on the number of data determined to be valid. The completeness percentage was 100%

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

Bechtel Hanford, Inc., *Validation Procedure for Chemical Analysis*, BHI-01435. Rev 0, Richland, Washington, 2000

U. S. Department of Energy, *Uranium-Rich/General Process Condensate and Process Waste Group Operable Units RI/FS Work Plan and RCRA TSD Unit Sample Pan-Includes 200-PW-2 and 200-PW-4 Operable Units*, DOE-RL-2000-60, Rev. 1, Richland, Washington, 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI 01435 and BHI 01433.

U - Indicates the compound or analysis was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data was usable for decision making purposes.

J – Indicates the compound or analyte was analyzed and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data was usable for the decision making purposes.

BJ – Applied to inorganic analyses only. Indicates that the analyte concentration is Greater than the IDL but less than the CRDL and is considered an estimate.

R – Indicates the compound or analyte was analyzed for, detected and due to identified major QC deficiency, the data are unusable.

UR – Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to a major QC deficiency.

NJ – Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e. usable for decision making purposes).

N – Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e. usable for decision making purposes).

Appendix 2

Summary of Data Qualifiers

DATA QUALIFICATION SUMMARY

SDG: H2329C	REVIEWER: MAH/MSM	DATE: 11/18/03, 11/22/03	PAGE 1 OF 1
COMMENTS:			
SAMPLES AFFECTED	**QUALIFIER**	**COMPOUND**	**REASON**
B17HX8	UJ	dicamba, 2,4,5T, 2,4-DB and dalapon	Matrix spike
B17HR9	UJ	All herbicides	surrogate

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Lionville Laboratory, Inc.
Herbicides, Special List

Report Date: 09/30/03 15:06

RFW Batch Number: 0309L404 Client: TWDHANFORD #03-006 H2329 Work Order: 11343606001 Page: 1

	Cust ID:	B17HR9	B17HX4	B17HX8	B17HX8	B17HX8	B17HX9
Sample Information	RFW#:	001	004	007	007 MS	007 MSD	008
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/kg Val.d.	ug/kg	ug/kg Val.d.	ug/kg	ug/kg	ug/kg
Surrogate:	DCAA	49 % fl	77 % fl	70 % fl	51 % fl	57 % fl	69 % fl
Dalapon		180 U UJ	180 U	190 U UJ	42 * %	46 * %	190 U
Dicamba		72 U UJ	73 U	74 U UJ	10 * %	14 * %	75 U
Dichloroprop		180 U UJ	180 U	190 U	53 %	46 * %	190 U
2,4-D		36 U UJ	36 U	7.1 J	41 %	43 %	37 U
2,4,5-TP (Silvex)		18 U UJ	3.3 J	19 U	62 %	69 %	19 U
2,4,5-T		18 U UJ	18 U	19 U UJ	37 * %	45 * %	19 U
2,4-DB		180 U UJ	180 U	190 U UJ	42 * %	48 * %	190 U
Dinoseb		18 U UJ	18 U	19 U	49 %	61 %	19 U

	Cust ID:	B17HX4	B17J02	PBLKFU	PBLKFU BS
Sample Information	RFW#:	009	010	03LE1155-MB1	03LE1155-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	ug/kg	ug/kg	ug/kg	ug/kg
Surrogate:	DCAA	42 % fl	62 % fl	76 % fl	97 % fl
Dalapon		180 U	180 U	170 U	53 %
Dicamba		70 U	73 U	67 U	78 %
Dichloroprop		180 U	180 U	170 U	91 %
2,4-D		35 U	37 U	33 U	71 %
2,4,5-TP (Silvex)		18 U	18 U	17 U	81 %
2,4,5-T		18 U	18 U	17 U	78 %
2,4-DB		180 U	180 U	170 U	87 %
Dinoseb		18 U	18 U	17 U	87 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

9/30/03

3F

SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Lionville Labs, Inc. Contract: 1343-06-01

Case No.: TNUHANFORD F03-006 H2329 RFW Lot No.: 0309L404-007

MATRIX Spike - Sample No.: B17HX8 Level:(low/med) LOW

COMPOUND	SPIKE ADDED UG/KG	SAMPLE CONCENTRATION UG/KG	MS CONCENTRATION UG/KG	MS % REC #	QC LIMITS REC
Delapon	928	0	393	42 *	50 -150
Dicamba	371	0	36.0	10 *	50 -150
Dichloroprop	928	0	491	53	50 -150
2,4-D	186	7.06	82.5	41	41 -144
2,4,5-TP (Silvex)	92.8	0	57.6	62	42 -148
2,4,5-T	92.8	0	34.2	37 *	60 -143
2,4-DB	928	0	388	42 *	60 -160
Dinoseb	186	0	91.0	49	20 -100

COMPOUND	SPIKE ADDED UG/KG	MSD CONCENTRATION UG/KG	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Delapon	928	429	46 *	9	200	50 -150
Dicamba	371	50.1	14 *	33	200	50 -150
Dichloroprop	928	429	46 *	14	200	50 -150
2,4-D	186	86.5	43	4	200	41 -144
2,4,5-TP (Silvex)	92.8	63.9	69	10	200	42 -148
2,4,5-T	92.8	41.6	45 *	19	200	60 -143
2,4-DB	928	445	48 *	13	200	60 -160
Dinoseb	186	114	61	21	200	20 -100

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 8 outside limits
Spike Recovery: 9 out of 16 outside limits

COMMENTS:

FORM III PEST-2 5/88 Rev.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU HANFORD F03-006
LVL#: 0309L404
SDG/SAF#: H2329/F03-006

W.O.#: 11343-606-001-9999-00
Date Received: 09-06-03

HERBICIDE

The set of samples consisted of six (6) soil samples collected on 09-03,04-03.

The samples and their associated QC samples were extracted on 09-16-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 09-18,26-03. The extraction and analysis procedure was based on method 8151A.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. Nine (9) of sixteen (16) matrix spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. To the best of my knowledge, this data report is in compliance with the terms and conditions of the purchase order, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hard copy data package and in the electronic data submitted on diskette has been authorized by the cognizant laboratory manager or his/her designee to be accurate as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

11/6/03
Date

pefs:\group\data\herb\tnu\09L-404.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

Lionville Laboratory Use Only

03096404

Custody Transfer Record/Lab Work Request

LIONVILLE LABORATORY INC

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: TNU Hanford F03-006

Est. Final Proj. Sampling Date

Project #: 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 9-6-03 Date Due: 10-6-03

	A (Pest/PCB)	B (Herb)	C (Hex Chrom)	D (NO2/NO3)	E (Oil + Grease)
Refrigerator #	4	1		1	4
#/Type Container – Liquid					
#/Type Container – Solid	1ag	1ag	1ag	1ag	1ag
Volume – Liquid					
Volume – Solid	60	250	125	60	125
Preservatives	–	–	–	–	–

ANALYSES REQUESTED: ORGANIC (VOA, BNA, Pest/PCB, Herb); INORG (Metal, CN, Hex Chrom, NO2/NO3, Oil + Grease)

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB (0608H)	Herb (0HDGX)	Metal	CN	Hex Chrom (ICR6)	NO2/NO3 (INUN)	Oil + Grease (IOGGR)
001	B17HR9			S	9-3-03	0841			X	X			X	X	X
002	B17HT0			↓	↓	0857							X	X	X
003	B17HT1					1350							X	X	X
004	B17HX4					0920			X	X			X	X	X
005	B17HX5					0930							X	X	X
006	B17HX6				9-4-03	1025							X	X	X
007	B17HX8				9-3-03	1000			X	X			X	X	X
008	B17HX9				↓	1030			X	X			X	X	X
009	B17HY4				9-4-03	1240			X	X			X	X	X
010	B17J02			↓	9-3-03	1000			X	X			X	X	X

Special Instructions: SAF # F03-006

Run Matrix QC

DATE/REVISIONS:

1. → Did not receive volume for
2. Pest, Herb + O+G analysis for sample 010
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered; Airbill #

2) Ambient or (Chilled)

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.8 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
[signature]	[signature]	9-6-03	1035	"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7914 9192 7033

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FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-242	Page 1 of 1

Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom — Telephone No.: 373-3928	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin — C4113	SAF No.: F03-006	Air Quality ☐
Ice Chest No.: SEE OSR RECRA	Field Logbook No.: HNF-N-3361 — COA: 117504ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA)	Offsite Property No.: A030 34C	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A — Tie To 300 Bldg

Special Handling and/or Storage
N/A — Cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL			

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See Item (1) for Special Instructions	Tritium - H3				
B17HR9	SOIL	9-3-03	0841	X	X	X	X	X	X	X				
B17HT0	SOIL	9-3-03	0857		9-3-03	X	X	X						
B17HT1	SOIL	9-3-03	1350			X	X	X						
~~B17HT2~~	SOIL	~~9-3-03~~ MG 9-4-03				X	X	X						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	9-3-03 1500	MO-026 Ref # 1	9-3-03 1500
MO-026 Ref # 1	9-4-03 1400	[illegible]	9-4-03
[illegible]	9-4-03 1430	Ref # 3C	9-4-03 1430
3C 3728	9-5-03 0900	[illegible]	9-5-03
[illegible]	9-5-03 1005	Fed Ex	
Fed Ex	9-6-03 1025	[illegible]	9-6-03 1025

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radi characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728
Ref # 3C on 9/5/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

14

FH-Central Plateau Project — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F03-000-245

Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom	Telephone No.: 373-3928	Project Coordinator: TRENT, SJ
Price Code: 8N	Data Turnaround: 45 Days	Air Quality: ☐	
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin - C4114		SAF No.: F03-006
Ice Chest No.: SEE OSRC	Field Logbook No.: HNF-N-336[illegible]	COA: 117504ES10	Method of Shipment: Federal Express
Shipped To: TMD 9-3-03 ESERLINE SERVICES (Formerly TMA) Pasco	Offsite Property No.: A030 346		Bill of Lading/Air Bill No.: SEE OSRC

POSSIBLE SAMPLE HAZARDS/REMARKS
NA — Tc-99 B17J00

Special Handling and/or Storage
NA — cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL			
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See Item (1) for Special Instructions	Tritium - H3			

Sample No.	Matrix *	Sample Date	Sample Time									
B17HX4	SOIL	9-3-03	0920	X	X	X	X	X				
B17HX5	SOIL	9-3-03	0930			X	X	X				
B17HX6	SOIL	9-3-03	1025			X	X	X				
~~B17HX7~~	~~SOIL~~	9-3-03				X	X	X				
~~B17J02~~	~~SOIL~~	9-3-03				TMD	9-4-03	X				

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	9-3-03 1500	TMD-200 REF #1	9-3-03 1500
TMD-200 REF #1	9-4-03 1400	[illegible]	9-4-03 1400
[illegible]	9-4-03 1800	TMD #3	9-4-03 1420
3C 3728	9.5.03 800	[illegible]	9.5.03 0700
[illegible] ERC	9.5.03 1000	[illegible]	
[illegible]	9.6.03/1025	[illegible]	9.6.03/1025

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728
Ref # 3C on 9.15.03

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

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FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-245	Page 1 of 1

2

Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom — Telephone No. 373-3928	Project Coordinator: TRENT, SJ	Price Code 8N — Data Turnaround 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin - C4115	SAF No. F03-006	Air Quality ☐
Ice Chest No. SEE OSPC	Field Logbook No. HNF-N-3361 — COA 117504ES10	Method of Shipment: Federal Express	
Shipped To: ~~EBERLINE SERVICES (Formerly IMA)~~ Recra MTJ 9-4-03	Offsite Property No. A030 546	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A Tie to B17J00

Special Handling and/or Storage
N/A cool 4°C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None
Type of Container	aG	aG	aG	aG	aG	aG	aG
No. of Container(s)	1	1	1	1	1	1	~~1~~
Volume	60mL	250mL	125mL	60mL	125mL	60mL	~~60mL~~
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) in Special Instructions	~~Tritium - H3~~

MTJ 9-4-03

Sample No.	Matrix *	Sample Date	Sample Time	Pesticides	Chloro-Herbicides	Chromium Hex	NO2/NO3	Oil & Grease	See item (1)	Tritium
B17HX8	SOIL	9-3-03	1000	X	X	X	X	X		
B17HX9	SOIL	9-3-03	1030	X	X	X	X	X		
B17HY4	SOIL	9-4-03	1240	X	X	X	X	X		
~~B17HY5~~	~~SOIL~~ MTJ 9-4-03									
B17J02	SOIL	9-3-03	1000	X	X	X	X	X		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	9-3-03	[illegible] Ref#1	9-3-03 1500
[illegible] Ref #1	9-4-03 1400	[illegible]	9-4-03 1400
[illegible]	9-4-03 1430	Ref #3C	9-4-03 1430
3C 3728	9-5-03 1000	R. [illegible]	9-5-03 1000
R. [illegible]	9-5-03 1000	FedEx	
[illegible]	9-6-03/1025	[illegible]	9-6-03/1025

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radi characteristics.

~~(1) Technetium-99; Strontium-89,90 – Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237.~~ MTJ 9-4-03

Personnel not available to relinquish samples from the 3728 Ref # 3C on 9/5/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200 Area			DATA PACKAGE: H 2329		
VALIDATOR: MSK		LAB: Lionville		DATE: 11/18/03	
CASE:			SDG: H 2329		
ANALYSES PERFORMED					
8015	8021	8141	8151	8315	Chlorinated Herbicides 8151A
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX:					
Soil					

1. **DATA PACKAGE COMPLETENESS AND CASE NARRATIVE**

Technical verification documentation present? ..... (Yes) No N/A

Comments: _____

2. **INSTRUMENT TUNING AND CALIBRATION (Levels D and E)**

Initial calibrations acceptable? ..... Yes No (N/A)

Continuing calibrations acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No (N/A)
Calibration blank results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No (N/A)
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... (Yes) No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes (No) N/A
Surrogates traceable? (Levels D, E) ..... Yes No (N/A)
Surrogates expired? (Levels D, E) ..... Yes No (N/A)
MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... Yes (No) N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes No (N/A)
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: MS/MSD for spk # B17HX8 is outside of control limits for Heptachlor, dieldrin, 2,4,5-T and 2,4-DB. Data to be flagged with "UJ"
%RPD for B17HX8 is also out of control limits
Surrogate recovery for B17HR9 is out of control
Sample data to be flagged "UJ"

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	(Yes)	No	N/A
Duplicate results acceptable?	Yes	(No)	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	(N/A)
MS/MSD standards expired? (Levels D, E)	Yes	No	(N/A)
Field duplicate RPD values acceptable?	Yes	No	(N/A)
Field split RPD values acceptable?	Yes	No	(N/A)
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: see note in section 4

6. HOLDING TIMES (all levels)

Samples properly preserved?	(Yes)	No	N/A
Sample holding times acceptable?	(Yes)	No	N/A

Comments: Not all samples on C-O-C received. No explanation However, All that were marked for Herbicide Destiny were reported.

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: _____

_____

_____

_____

_____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No (N/A)

Lot check performed? ..... Yes No (N/A)

Check recoveries acceptable? ..... Yes No (N/A)

Check materials traceable? ..... Yes No (N/A)

Check materials Expired? ..... Yes No (N/A)

Analytical batch QC given similar cleanup? ..... Yes No (N/A)

Transcription/Calculation Errors? ..... Yes No (N/A)

Comments: _____

_____

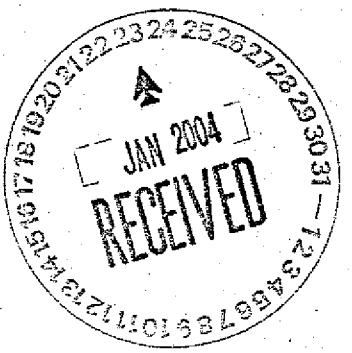
_____

_____

_____

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments:



Date: November 18, 2003
To: Fluor Hanford Inc.
From: EQM
Project: PW-2/PW-4, 207-A Borehole
Subject: Radiochemistry-Data Package No. H2329

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2329 prepared by Eberline Services. A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B17HX8	09/03/03	Soil	C	See note 1
B17HX9	09/03/03			
B17HY4	09/04/03			
B17J02	09/03/03			
B17HX4	09/03/03			
B17HX5	09/03/03			
B17HX6	09/04/03			
B17HR9	09/03/03			
B17HTO	09/03/03			
B17HT1	09/03/03			

1- Alpha spectroscopy (Th-232), Np-237, Tc-99, Sr-89, 90 (Total), C-14, I-129, Ni-63, H-3.

Data validation was conducted in accordance with BHI validation procedure, *Data Validation Procedure for Radiochemical Analysis*, October 2000, BHI-01433, Rev. 0 and the *Uranium-Rich/General Process Condensate and Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan*, DOE/RL-2000-60, Rev. 1. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Data Requested by Client—none required, not apply

DATA QUALITY PARAMETERS

- **Holding Times**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

  All holding times were acceptable.

- **Preparation (Method) Blanks**

  Laboratory Blanks

  Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; samples results above the MDA and greater than five times the highest blank concentration are not qualified.

  All blank results were acceptable.

  Field Blank

  No field blanks were submitted for analysis.

- **Accuracy**

  Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 65-135%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30%, tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

  All LCS accuracy results were acceptable.

  Due to the lack of a matrix spike analysis for C-14, and because no tracer or carrier was used on the C-14 analysis, all C-14 results were "J" flagged.

  Due to a tracer recovery of 17% for sample B17HX6, the I-129 result for that sample have been "J" flagged.

- **Duplicates**

  Laboratory Duplicates

  Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If a duplicate sample was not analyzed, qualify all associated sample results as estimated (J, UJ). If the sample and duplicate concentration are both >5xRDL and the RPD is >20% for water samples (>35% for soil samples), qualify all associated sample and duplicate results as estimated (J). If both sample and duplicate results are non-detect, no qualification is required. If either or both of the sample and duplicate sample concentrations are <5xRDL, the above RPD criteria do not apply and the range of the sample and duplicate concentrations must be evaluated as follows:

  - If the range in concentration between the sample result(s) or quantitation limit(s) are ≤RDL unit for water samples (≤2xRDL units for soil samples), no qualification is required.
  - If the range in concentration between the sample result of quantitation limit are >RDL unit for water samples (>2xRDL units for soil samples), then qualify all associated sample results as estimated (J). Non-detects are not qualified.

  All duplicate results are acceptable.

  Field Duplicate

  Sample B17J02 was a field duplicate of sample B17HX8. All field duplicate results are acceptable.

- **Detection Levels**

  The MDA exceeded the RDL for all I-129 sample results.

  As per the data validation procedure, no qualifiers are required to be applied to the data.

- **Completeness**

  Data package No.H2329 was submitted for validation and verified for completeness. Completeness is based on the percentage of date determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

- Due to the lack of a matrix spike analysis for C-14, and because no tracer or carrier was used on the C-14 analysis, all C-14 results were "J" flagged.

- Due to a tracer recovery of 17% for sample B17HX6, the I-129 results for that sample have been "J" flagged.

REFERENCES

Data Validation Procedure for Radiochemical Analysis, October 2000, BHI-01433, Rev. 0

Uranium-Rich/General Process Condensate and Process Waste Group Operable Unit RI/FS Work Plan and RCRA TSD Unit Sampling Plan, DOE/RL-2000-60, Rev. 1.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimated, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the date are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2329	REVIEWER: KAB	DATE: 11/18/03	PAGE 1 OF 1
COMMENTS:			
SAMPLES AFFECTED	**QUALIFIER**	**COMPOUND**	**REASON**
B17HX8	J	C-14	No matrix spike
B17HX9	J	C-14	No matrix spike
B17HY4	J	C-14	No matrix spike
B17J02	J	C-14	No matrix spike
B17HX4	J	C-14	No matrix spike
B17HX5	J	C-14	No matrix spike
B17HX6	J J	I-129 C-14	Low Tracer Recovery No matrix spike
B17HR9	J	C-14	No matrix spike
B17HTO	J	C-14	No matrix spike
B17HT1	J	C-14	No matrix spike

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2329

7580-001 B17HR3

DATA SHEET

SDG 7580	Client/Case no Hanford	SDG H2329	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R309032-01	Client sample id B17HR3		
Dept sample id 7580-001	Location/Matrix 200-PW-4/Retention Basin	SOLID	
Received 09/08/03	Collected/Weight 09/03/03 08:41	101.0 g	
% solids 92.0	Custody/SAF No F03-006-242	F03-006	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.385	0.17	0.27	400		H
Carbon 14	14762-75-5	-1.06	2.2	3.8	50	U J	C
Nickel 63	13981-37-8	-0.379	1.4	2.3	30	U	NI_L
Total Strontium	SR-RAD	0.676	0.17	0.22	1.0		SR
Technetium 99	14133-76-7	0.123	0.18	0.44	15	U	TC
Thorium 228	14274-82-9	0.535	0.26	0.24			TH
Thorium 230	14269-63-7	0.252	0.19	0.24	1.0		TH
Thorium 232	TH-232	0.535	0.25	0.24	1.0		TH
Neptunium 237	13994-20-2	0	0.019	0.044	1.0	U	NP
Iodine 129	15046-84-1	-5.00	3.7	8.6	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-002 B17HT0

DATA SHEET

SDG	7580	Client/Case no	Hanford SDG H2329
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R309032-02	Client sample id	B17HT0
Dept sample id	7580-002	Location/Matrix	200-PW-4/Retention Basin SOLID
Received	09/08/03	Collected/Weight	09/03/03 08:57 108.3 g
% solids	91.3	Custody/SAF No	F03-006-242 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.820	0.17	0.25	400		H
Carbon 14	14762-75-5	-0.480	2.1	3.6	50	U J	C
Nickel 63	13981-37-8	-0.667	1.4	2.3	30	U	NI_L
Total Strontium	SR-RAD	0.446	0.15	0.22	1.0		SR
Technetium 99	14133-76-7	0.093	0.19	0.58	15	U	TC
Thorium 228	14274-82-9	0.479	0.26	0.24			TH
Thorium 230	14269-63-7	0.510	0.26	0.24	1.0		TH
Thorium 232	TH-232	0.702	0.32	0.24	1.0		TH
Neptunium 237	13994-20-2	0.005	0.039	0.070	1.0	U	NP
Iodine 129	15046-84-1	-0.290	1.6	3.6	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-003 B17HT1

DATA SHEET

SDG 7580	Client/Case no Hanford	SDG H2329	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R309032-03	Client sample id B17HT1		
Dept sample id 7580-003	Location/Matrix 200-PW-4/Retention Basin	SOLID	
Received 09/08/03	Collected/Weight 09/03/03 13:50	83.3 g	
% solids 98.8	Custody/SAF No F03-006-242	F03-006	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.015	0.15	0.26	400	U	H
Carbon 14	14762-75-5	-0.627	1.5	2.5	50	U J	C
Nickel 63	13981-37-8	-0.640	1.3	2.3	30	U	NI_L
Total Strontium	SR-RAD	0.046	0.13	0.25	1.0	U	SR
Technetium 99	14133-76-7	0.095	0.18	0.56	15	U	TC
Thorium 228	14274-82-9	0.120	0.12	0.23		U	TH
Thorium 230	14269-63-7	0.360	0.24	0.23	1.0		TH
Thorium 232	TH-232	0.180	0.12	0.23	1.0	U	TH
Neptunium 237	13994-20-2	-0.026	0.021	0.059	1.0	U	NP
Iodine 129	15046-84-1	-1.68	2.9	6.7	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-004 B17HK4

DATA SHEET

SDG 7580		Client/Case no Hanford	SDG H2329
Contact Melissa C. Mannion		Contract No. 630	
Lab sample id R309032-04		Client sample id B17HK4	
Dept sample id 7580-004		Location/Matrix 200-PW-4/Retention Basin SOLID	
Received 09/08/03		Collected/Weight 09/03/03 09:20 119.0 g	
% solids 91.4		Custody/SAF No F03-006-243	F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	6.24	0.30	0.26	400		H
Carbon 14	14762-75-5	-0.272	3.1	3.6	50	U J	C
Nickel 63	13981-37-8	-0.866	1.4	2.5	30	U	NI_L
Total Strontium	SR-RAD	1.40	0.23	0.23	1.0		SR
Technetium 99	14133-76-7	0.050	0.17	0.56	15	U	TC
Thorium 228	14274-82-9	0.344	0.21	0.26			TH
Thorium 230	14269-63-7	0.447	0.28	0.26	1.0		TH
Thorium 232	TH-232	0.722	0.35	0.26	1.0		TH
Neptunium 237	13994-20-2	-0.020	0.029	0.071	1.0	U	NP
Iodine 129	15046-84-1	-2.77	2.2	5.1	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-005 B17HX5

DATA SHEET

SDG	7580	Client/Case no	Hanford SDG H2329
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R309032-05	Client sample id	B17HX5
Dept sample id	7580-005	Location/Matrix	200-PW-4/Retention Basin SOLID
Received	09/08/03	Collected/Weight	09/03/03 09:30 107.8 g
% solids	92.4	Custody/SAF No	F03-006-243 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	12.4	0.39	0.25	400		H
Carbon 14	14762-75-5	-0.214	2.0	3.4	50	U J	C
Nickel 63	13981-37-8	-0.817	1.4	2.3	30	U	NI_L
Total Strontium	SR-RAD	1.34	0.22	0.21	1.0		SR
Technetium 99	14133-76-7	0	0.21	0.60	15	U	TC
Thorium 228	14274-82-9	0.705	0.48	0.45			TH
Thorium 230	14269-63-7	0.528	0.36	0.45	1.0		TH
Thorium 232	TH-232	0.528	0.36	0.45	1.0		TH
Neptunium 237	13994-20-2	0.074	0.074	0.11	1.0	U	NP
Iodine 129	15046-84-1	-3.74	5.1	12	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-006 B17HX6

DATA SHEET

SDG	7580	Client/Case no	Hanford SDG H2329
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R3309032-06	Client sample id	B17HX6
Dept sample id	7580-006	Location/Matrix	200-PW-4/Retention Basin SOLID
Received	09/08/03	Collected/Weight	09/04/03 10:25 137.6 g
% solids	96.0	Custody/SAF No	F03-006-243 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	5.68	0.28	0.25	400		H
Carbon 14	14762-75-5	0.144	1.5	2.5	50	U J	C
Nickel 63	13981-37-8	-1.92	1.3	2.3	30	U	NI_L
Total Strontium	SR-RAD	0.007	0.13	0.27	1.0	U	SR
Technetium 99	14133-76-7	0.024	0.21	0.56	15	U	TC
Thorium 228	14274-82-9	0.332	0.24	0.23			TH
Thorium 230	14269-63-7	0.512	0.24	0.23	1.0		TH
Thorium 232	TH-232	0.331	0.18	0.23	1.0		TH
Neptunium 237	13994-20-2	-0.037	0.075	0.29	1.0	U	NP
Iodine 129	15046-84-1	0.470	2.0	4.6	2.0	U J	I

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SAMPLE DELIVERY GROUP H2329

7580-007 B17HX8

DATA SHEET

SDG	7580	Client/Case no	Hanford SDG H2329
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R309032-07	Client sample id	B17HX8
Dept sample id	7580-007	Location/Matrix	200-PW-4/Retention Basin SOLID
Received	09/08/03	Collected/Weight	09/03/03 10:00 105.6 g
% solids	95.4	Custody/SAF No	F03-006-245 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.295	0.16	0.25	400		H
Carbon 14	14762-75-5	1.22	2.3	3.7	50	U J	C
Nickel 63	13981-37-8	-0.805	1.4	2.4	30	U	NI_L
Total Strontium	SR-RAD	1.22	0.21	0.22	1.0		SR
Technetium 99	14133-76-7	0.049	0.18	0.57	15	U	TC
Thorium 228	14274-82-9	0.714	0.29	0.22			TH
Thorium 230	14269-63-7	1.26	0.41	0.22	1.0		TH
Thorium 232	TH-232	0.514	0.23	0.22	1.0		TH
Neptunium 237	13994-20-2	-0.012	0.025	0.076	1.0	U	NP
Iodine 129	15046-84-1	-0.998	3.4	7.8	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-010 B17J02

DATA SHEET

SDG 7580 Client/Case no Hanford SDG H2329
Contact Melissa C. Mannion Contract No. 630

Lab sample id R309032-10 Client sample id B17J02
Dept sample id 7580-010 Location/Matrix 200-PW-4/Retention Basin SOLID
Received 09/08/03 Collected/Weight 09/03/03 10:00 78.6 g
% solids 90.8 Custody/SAF No F03-006-245 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.205	0.15	0.25	400	U	H
Carbon 14	14762-75-5	-0.238	2.2	3.7	50	U J	C
Nickel 63	13981-37-8	-1.05	1.5	2.5	30	U	NI_L
Total Strontium	SR-RAD	0.969	0.19	0.21	1.0		SR
Technetium 99	14133-76-7	0.101	0.19	0.58	15	U	TC
Thorium 228	14274-82-9	0.410	0.28	0.26			TH
Thorium 230	14269-63-7	0.511	0.28	0.26	1.0		TH
Thorium 232	TH-232	0.580	0.28	0.26	1.0		TH
Neptunium 237	13994-20-2	-0.005	0.021	0.058	1.0	U	NP
Iodine 129	15046-84-1	-0.850	1.3	3.0	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-008 B17HX9

DATA SHEET

SDG	7580	Client/Case no	Hanford SDG H2329
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R309032-08	Client sample id	B17HX9
Dept sample id	7580-008	Location/Matrix	200-PW-4/Retention Basin SOLID
Received	09/08/03	Collected/Weight	09/03/03 10:30 68.3 g
% solids	89.1	Custody/SAF No	F03-006-245 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.156	0.15	0.25	400	U	H
Carbon 14	14762-75-5	-0.296	2.1	3.6	50	U J	C
Nickel 63	13981-37-8	-0.758	1.6	2.8	30	U	NI_L
Total Strontium	SR-RAD	1.18	0.21	0.21	1.0		SR
Technetium 99	14133-76-7	0.083	0.17	0.54	15	U	TC
Thorium 228	14274-82-9	0.681	0.31	0.24			TH
Thorium 230	14269-63-7	0.773	0.31	0.24	1.0		TH
Thorium 232	TH-232	0.371	0.19	0.24	1.0		TH
Neptunium 237	13994-20-2	-0.016	0.021	0.045	1.0	U	NP
Iodine 129	15046-84-1	0.513	1.0	2.4	2.0	U	I

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SAMPLE DELIVERY GROUP H2329

7580-009 B17HY4

DATA SHEET

SDG	7580	Client/Case no	Hanford SDG H2329
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R309032-09	Client sample id	B17HY4
Dept sample id	7580-009	Location/Matrix	200-PW-4/Retention Basin SOLID
Received	09/08/03	Collected/Weight	09/04/03 12:40 117.6 g
% solids	94.8	Custody/SAF No	F03-006-245 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	16.6	0.44	0.26	400		H
Carbon 14	14762-75-5	0.746	2.1	3.5	50	U J	C
Nickel 63	13981-37-8	-0.407	1.5	2.5	30	U	NI_L
Total Strontium	SR-RAD	0.067	0.14	0.26	1.0	U	SR
Technetium 99	14133-76-7	0.124	0.20	0.61	15	U	TC
Thorium 228	14274-82-9	0.491	0.25	0.23			TH
Thorium 230	14269-63-7	0.429	0.25	0.23	1.0		TH
Thorium 232	TH-232	0.521	0.25	0.23	1.0		TH
Neptunium 237	13994-20-2	0.043	0.043	0.059	1.0	U	NP
Iodine 129	15046-84-1	-3.60	4.6	11	2.0	U	I

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Lab id	ESERLNS
Protocol	Hanford
Version	Var 1.0
Form	DVD-DS
Version	3.06
Report date	10/22/03

DATA SHEETS
Page 9
SUMMARY DATA SECTION
Page 25

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2329 was composed of eleven soil samples designated under SAF No. F03-006 with a Project Designation of: 200-PW-2/200-PW-4 OU – Borehole Soil Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Iodine-129 Analyses

Sample B17HX6 had a yield of 17% (Lower Limit 20%). No other problems were encountered during the course of the analyses.

2.7 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.8 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.9 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.10 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.11 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.12 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.13 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion — 10/22/13

Melissa C. Mannion
Program Manager

Date

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-245	Page 1 of 1

Collector Pope/Pfister/Hughes	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ
Price Code 8N	Data Turnaround 45 Days		
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 200-PW-4/Retention Basin - C4115 H2329 (7580)	SAF No. F03-006	Air Quality ☐
Ice Chest No. SEE OSPC	Field Logbook No. HNF-N-3361	COA 117504BS10	Method of Shipment Federal Express
Shipped To EBERLINE SERVICES (Formerly TMA)	Offsite Property No. A030 357		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A Tie To B17J00

Special Handling and/or Storage
N/A

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL			
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) in Special Instructions.	Tritium - H3			

(Columns 1–5 crossed out with a diagonal line, initialed "TMJ 9-4-03")

Sample No.	Matrix *	Sample Date	Sample Time										
B17HX8	SOIL	9-3-03	1000						X	X			
B17HX9	SOIL	9-3-03	1030						X	X			
B17HY4	SOIL	9-4-03	1240						X	X			
~~B17HY5~~	~~SOIL~~ TMJ 9-4-03												
~~B17J00~~ 9-3-03 B17J02	Soil	9-3-03	1000						X	X			

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From [signature] Date/Time 9-3-03 1500	Received By/Stored In MO-0268 Ref# 1 Date/Time 9-3-03 1500
Relinquished By/Removed From MO-0268 Ref#1 Date/Time 9-4-03 1400	Received By/Stored In [signature] Date/Time 9-4-03 1400
Relinquished By/Removed From [signature] Date/Time 9-4-03 1430	Received By/Stored In Ref#3C Date/Time 9-4-03 1430
Relinquished By/Removed From 3C 9-5-03 3728 1000 Date/Time	Received By/Stored In R. Gallo R. Gallo Date/Time 9-5-03 1000
Relinquished By/Removed From ERC R Gallo R. Gallo 9-5-03 Date/Time 1000	Received By/Stored In FedEx Date/Time
Relinquished By/Removed From Fed Ex Date/Time	Received By/Stored In [signature] Date/Time 9-8-03 1000

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radi characteristics.

(1) Technetium-99; Strontium-89,90 – Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728 Ref# 3C on 9/5 1035 [initials]

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

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FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-243	Page 1 of 1

Collector Pope/Pfister/Hughes	Company Contact LC Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 200-PW-4/Retention Basin - C4114 H2329 (7580)		SAF No. F03-006
Ice Chest No. SEE OSRC	Field Logbook No. HNF-N-336I	COA 117504ES10	Method of Shipment Federal Express
Shipped To EBERLINE SERVICES (Formerly TMA)	Offsite Property No. A030 357		Bill of Lading/Air Bill No. SEE OSRC

Price Code 8N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

~~N/A~~ Tie To B17J00

Special Handling and/or Storage

N/A None

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL			
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium-Hex 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) in Special Instructions.	Tritium - H3			

TMJ 9-3-03

Sample No.	Matrix *	Sample Date	Sample Time										
B17HX4	SOIL	9-3-03	0920						X	X			
B17HX5	SOIL	9-3-03	0930						X	X			
B17HX6	SOIL	9-4-03	1025						X	X			
~~B17HX7~~	~~SOIL~~			TMJ 9-4-03					~~X~~	~~X~~			
* ~~B17J02~~	~~SOIL~~			TMJ 9-4-03					~~X~~	~~X~~			

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By/Removed From [signature]	9-3-03 1800	Received By/Stored In MO-026 Ref#1	9-3-03 1800
Relinquished By/Removed From MO-026 Ref#1	9-4-03 1400	Received By/Stored In [signature]	9-4-03 1400
Relinquished By/Removed From [signature]	9-4-03 1430	Received By/Stored In Ref #3C	9-4-03 1430
Relinquished By/Removed From 3C 3728	9-5-03 1000	Received By/Stored In R. Gallo [signature]	9-5-03 1000
Relinquished By/Removed From ERC R. Gallo [signature]	9-5-03 1000	Received By/Stored In Fed Ex	
Relinquished By/Removed From Fed Ex		Received By/Stored In [signature]	9-8-03 1000

SPECIAL INSTRUCTIONS

FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the rad characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728 Ref# 3C on 9/5/03 te

* Sample B17J02 WAS Received by 9-8-03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-242	Page 1 of 1
Collector Pope/Pfister/Hughes	Company Contact I.C Hulstrom	Telephone No. 373-3928	Project Coordinator TRENT, SJ	Price Code 8N Air Quality ☐	Data Turnaround 45 Days
Project Designation 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location 200-PW-4/Retention Basin – C4113 H2329 (7580)		SAF No. F03-006		
Ice Chest No. SEE OSR	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Federal Express		
Shipped To EBERLINE SERVICES (Formerly TMA)	Offsite Property No. A030 357		Bill of Lading/Air Bill No. SEE OSR		

POSSIBLE SAMPLE HAZARDS/REMARKS

~~N/A~~ Tie To B17J00

Special Handling and/or Storage

N/A

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL			
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See Item (1) in Special Instructions.	Tritium - H3			
Sample No.	Matrix *	Sample Date	Sample Time							
B17HR9	SOIL	9-3-03	0841				X	X		
B17HT0	SOIL	9-3-03	0857				X	X		
B17HT1	SOIL	9-3-03	1350				X	X		
~~B17HT2~~	~~SOIL~~	9-3-03	[illegible] 9-4-03				X	X		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	9-3-03 1500	MO-020 Lof # 1	9-3-03 1500
Relinquished By/Removed From MO-020 Lof # 1	Date/Time 9-4-03 1400	Received By/Stored In [signature]	Date/Time 9-4-03 1400
Relinquished By/Removed From [signature]	Date/Time 9-4-03 1400	Received By/Stored In Lof # 3C	Date/Time 9-4-03 1400
Relinquished By/Removed From 3C 3728	Date/Time 9-5-03 1000	Received By/Stored In [signature]	Date/Time 9-5-03 1000
Relinquished By/Removed From [signature]	Date/Time 9-8-03 1000	Received By/Stored In FedEx	Date/Time
Relinquished By/Removed From FedEx	Date/Time	Received By/Stored In [signature]	Date/Time 9-8-03 (10:)

SPECIAL INSTRUCTIONS

FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radi characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728
Ref # 3C on 9/5/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time	

BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 200-A-Basin, PW-4 Borehole			DATA PACKAGE: H2329		
VALIDATOR: K. Braxmeier		LAB: Eberline		DATE: 11/17/03	
CASE:			SDG: H2329		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90 Total	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
(Total Uranium)	Radium-22	(Tritium)	C-14	(I-63)	I-129
SAMPLES/MATRIX: B17HX8, B17HX9, B17HY4, B17J02, B17HX4					
B17HX5, B17HX6, B17HR9, B17HT0, B17HT1					
Soil B173W6 (Not validated per client Request)					mm

1. Completeness ..... ☐ N/A

Technical verification forms present? ..... Yes No (N/A)

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No (N/A)

Initial calibration acceptable? ..... Yes No (N/A)

Standards NIST traceable? ..... Yes No (N/A)

Standards Expired? ..... Yes No (N/A)
Calculation check acceptable? ..... Yes No (N/A)
Comments: _____

3. Continuing Calibration (Levels D, E) ..... ☒ N/A

Calibration checked within required frequency? ..... Yes No (N/A)
Calibration check acceptable? ..... Yes No (N/A)
Calibration check standards traceable? ..... Yes No (N/A)
Calibration check standards expired? ..... Yes No (N/A)
Calculation check acceptable? ..... Yes No (N/A)
Comments: _____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No (N/A)
Background Counts acceptable? ..... Yes No (N/A)
Calculation check acceptable? ..... Yes No (N/A)
Comments: _____

5. Blanks (Levels B, C, D, E) ☐ N/A

Method blank analyzed within required frequency? (Yes) No N/A
Method blank results acceptable? Yes (No) N/A
Analytes detected in method blank? (Yes) No N/A
Field blank(s) analyzed? Yes No (N/A)
Field blank results acceptable? Yes No (N/A)
Analytes detected in field blank(s)? Yes No (N/A)
Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments:
Eu-152, Eu-154 and Eu-155 and Co-60 are "J" Flagged.
Also Ra-226 + Ra-228 ~~Sample B173W6~~ mm

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ☐ N/A

LCS /BSS analyzed within required frequency? (Yes) No N/A
LCS/BSS recoveries acceptable? (Yes) No N/A
LCS/BSS traceable? (Levels D,E) Yes No (N/A)
LCS/BSS expired? (Levels D,E) Yes No (N/A)
LCS/BSS levels correct? (Levels D,E) Yes No (N/A)
Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ☐ N/A

Chemical carrier added? (Yes) No N/A JRG for KB 1/17/04
Chemical recovery acceptable? (Yes) No N/A
Chemical carrier traceable? (Levels D, E) Yes No (N/A)

Chemical carrier expired? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: _____

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... (Yes) No N/A

Tracer recovery acceptable? ..... Yes (No) N/A

Tracer traceable? (Levels D, E) ..... Yes No (N/A)

Tracer expired? (Levels D, E) ..... Yes No (N/A)

Transcription/Calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: I-129 for sample B19HX6 had a tracer %oF 170 "J" flag results

9. Matrix Spikes (Levels C, D, E) ..... ☐ N/A

Matrix spike analyzed? ..... (Yes) No N/A

Spike recoveries acceptable? ..... (Yes) No N/A

Spike source traceable? (Levels D, E) ..... Yes No (N/A)

Spike source expired? Levels D, E) ..... Yes No (N/A)

Transcription/Calculation Errors? (Levels D, E) ..... Yes No (N/A)

Comments: No MS run w/ C-14 results. No tracer or carrier used. "J" C-14 results

JRF for KB 1/7/04

10. Duplicates (Levels C, D, E) ☐ N/A

Duplicates Analyzed at required frequency? (Yes) No N/A

RPD Values Acceptable? (Yes) No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No (N/A)

Comments: Although the lab calculated the RPD for U-233 as 43%, Neither the sample or dup was >5X RDL. Therefore, no qualifiers needed.

11. Field QC Samples (Levels C, D E) ☐ N/A

Field duplicate sample(s) analyzed? (Yes) No N/A

Field duplicate RPD values acceptable? (Yes) No N/A JPJ for KB 1/7/04

Field split sample(s) analyzed? Yes No (N/A)

Field split RPD values acceptable? Yes No (N/A)

Performance audit sample(s) analyzed? Yes No (N/A)

Performance audit sample results acceptable? Yes No (N/A) JPJ for KB 1/7/04

Comments: Sample B17HX8 is a Field duplicate of B17J02 No qualifiers in Field dups

12. Holding Times (All levels)

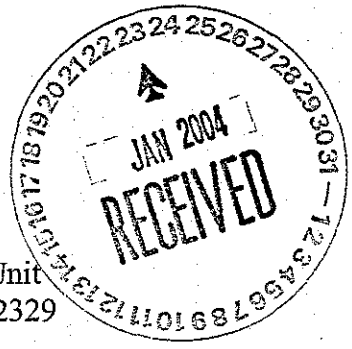
Are sample holding times acceptable? (Yes) No N/A

Comments:

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?(Levels D, E)	Yes	No	(N/A)
Results Acceptable? (Levels D, E)	Yes	No	(N/A)
Transcription/Calculation errors? (Levels D, E)	Yes	No	(N/A)
MDA's meet required detection limits?	Yes	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: I-129 For all sample, the MDA exceed the RDL
For sample B173W6, Co-60, Eu-152, 154 + 155 the MDA exceed the RDL



Date: 12/12/03
To: Fluor Hanford
From: EQM, Inc.
Project: 200 Area Source Characterization 200-PW-2 & 4 Operable Unit
Subject: General Chemistry Analysis, Method -Data Package SDG H2329

INTRODUCTION

This memo presents the results of Data Validation on Data Package SDG H2329 prepared by Lionville Laboratory, Inc. (LLI) for General Chemistry analysis. A list of samples validated along with the analysis reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B17HR9	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HT0	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HT1	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HX4	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HX5	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HX6	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HX8	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HX9	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17HY4	9/4/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3
B17J02	9/3/03	Soil	C	Percent solids, CR^{+6}, O&G, NO_2NO_3

Data validation was conducted in accordance with the BHI Validation Procedure for Chemical Analysis, BHI-01435, and Sampling and Analysis Plan, DOE/RL-2000-60, Rev. 1. Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifiers
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain of Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by the Client – not apply

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for oil and grease is 28 days, percent solids is not established, chromium VI is 28 days, and NO_2NO_3 by 353.2 method is 28 days.

  All holding times were met.

- **Method Blanks**

  At least one method blank per analytical batch of samples was analyzed. It consisted of deionized distilled water and was processed through each set of the sample preparation and analysis procedures.

  All method blanks fell within acceptable limits.

- **Field Blanks**

  No field blanks were submitted for analysis.

- **Accuracy**

  Matrix spike analyses were used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spikes must be analyzed at least one per analytical batch and must be taken through the same procedures and added as early in the sample preparation process as possible. Matrix spike recoveries must fall within the range of 75 to 125% which are the laboratory requirements dictated by the Sampling and Analysis Plan (SAP). If the sample concentration exceeds the spike concentration by a factor of 4 or more, no qualification is required.

  Matrix spikes were analyzed where applicable with acceptable results.

- **Laboratory Control Sample (LCS) or Blank Spike Sample (BBS)**

  LCSs /BSS are also used to measure accuracy. They are analyzed at a frequency of one per analytical batch. The acceptable limits for the LCS/ BSS are 80-120%

  All LCS/BSS met the acceptance criteria.

- **Precision**

  Duplicate Samples

  Laboratory duplicate samples are used to measure laboratory precision and sample homogeneity. They were analyzed at a frequency of one per batch. Duplicate samples were prepared at the same time, using the same procedures as their associated samples. Results must be within a relative percent difference (RPD) of $\leq$ 20% for non-aqueous samples that have a concentration of >5 times the RDL per the laboratory criteria dictated by the SAP.

  All duplicate results met these criteria.

  Field Duplicate Samples

  Sample B17J02 was a duplicate of sample B17HX8. All sample-to-sample RPDs met acceptance criteria.

- **Analytical Detection Limits**

  Reported analytical detection limits were compared against the requirements of the Sampling & Analysis Plan, DOE/RL-2000-60, Rev. 1.

  All required detection limits were met except for oil and grease. The O&G detection limits ranged from 695 to 748 mg/kg and all the samples were non-detects. The SAP required 200 mg/kg for low level samples and NA for high-activity soils. Results are well below the preliminary action limit of 2000 mg/kg. Method blank reporting limits were 667 mg/kg. No flags were applied as the preliminary action limit of 2000 mg/kg is well above the reporting limit. Nitrate/nitrite limits were commensurate with those limits in the SAP for ion chromatography methods, thus no flags were added.

- **Completeness**

  The data package for SDG: H2329 was submitted for validation and verified for completeness. Completeness was based on the number of data determined to be valid.

  The completeness percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

BHI 01435. Rev 1, Validation Procedure for Chemical Analysis

DOE-RL2000-60, Rev. 1, Uranium-Rich/General Process Condensate and Process Waste Group Operable Units RI/FS Work Plan and RCRA TSD Unit Sample Pan-Includes 200-PW-2 and 200-PW-4 Operable Units.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI-01435 and DOE/RL-2000-60.

U - Indicates the compound or analysis was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data was usable for decision making purposes.

J – Indicates the compound or analyte was analyzed and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data was usable for the decision making purposes.

BJ – Applied to inorganic analyses only. Indicates that the analyte concentration is Greater than the IDL but less than the CRDL and is considered an estimate.

R – Indicates the compound or analyte was analyzed for, detected and due to identified major QC deficiency, the data are unusable.

UR – Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to a major QC deficiency.

NJ – Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e. usable for decision making purposes).

N – Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e. usable for decision making purposes).

Appendix 2

Summary of Data Qualification

No data was qualified.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/26/03

CLIENT: TNUHANFORD F03-006 H2329 LVL LOT #: 0309L404

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B17HR9	% Solids	92.4		%	0.01	1.0
		Chromium VI	0.43	u	MG/KG	0.43	1.0
		Nitrate Nitrite	1.0		MG/KG	0.22	1.0
		Oil & Grease Gravimetri	722	u	MG/KG	722	1.0
-002	B17HT0	% Solids	91.7		%	0.01	1.0
		Chromium VI	0.44	u	MG/KG	0.44	1.0
		Nitrate Nitrite	5.1		MG/KG	0.23	1.0
		Oil & Grease Gravimetri	727	u	MG/KG	727	1.0
-003	B17HT1	% Solids	96.1		%	0.01	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Nitrate Nitrite	1.1		MG/KG	0.20	1.0
		Oil & Grease Gravimetri	694	u	MG/KG	694	1.0
-004	B17HX4	% Solids	91.9		%	0.01	1.0
		Chromium VI	0.44	u	MG/KG	0.44	1.0
		Nitrate Nitrite	8.9		MG/KG	0.21	1.0
		Oil & Grease Gravimetri	725	u	MG/KG	725	1.0
-005	B17HX5	% Solids	92.2		%	0.01	1.0
		Chromium VI	0.43	u	MG/KG	0.43	1.0
		Nitrate Nitrite	20.9		MG/KG	2.0	5.0
		Oil & Grease Gravimetri	723	u	MG/KG	723	1.0

07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/26/03

CLIENT: TNUHANFORD F03-006 H2329 LVL LOT #: 0309L404
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	B17HX6	% Solids	95.9		%	0.01	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Nitrate Nitrite	4.5		MG/KG	0.18	1.0
		Oil & Grease Gravimetri	695	u	MG/KG	695	1.0
-007	B17HX8	% Solids	89.7		%	0.01	1.0
		Chromium VI	0.45	u	MG/KG	0.45	1.0
		Nitrate Nitrite	1.6		MG/KG	0.24	1.0
		Oil & Grease Gravimetri	743	u	MG/KG	743	1.0
-008	B17HX9	% Solids	89.1		%	0.01	1.0
		Chromium VI	0.45	u	MG/KG	0.45	1.0
		Nitrate Nitrite	0.92		MG/KG	0.24	1.0
		Oil & Grease Gravimetri	748	u	MG/KG	748	1.0
-009	B17HY4	% Solids	94.7		%	0.01	1.0
		Chromium VI	0.42	u	MG/KG	0.42	1.0
		Nitrate Nitrite	13.2		MG/KG	0.44	2.0
		Oil & Grease Gravimetri	704	u	MG/KG	704	1.0
-010	B17J02	% Solids	91.0		%	0.01	1.0
		Chromium VI	0.44	u	MG/KG	0.44	1.0
		Nitrate Nitrite	1.3		MG/KG	0.21	1.0
		Oil & Grease Gravimetri	733	u	MG/KG	733	1.0

08

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006 H2329
LVL#: 0309L404

W.O.#: 11343-601-001-9999-00
Date Received: 09-06-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 10 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI, Nitrate Nitrite and Oil and Grease were within the 75-125% control limits.

8. The replicate analyses for Percent Solids, Chromium VI, Nitrate Nitrite and Oil and Grease were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

Date

njp\i09-404

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Use Only

03092404

Custody Transfer Record

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

LIONVILLE LABORATORY INC.

Client: TNU Hanford F03-006

Est. Final Proj. Sampling Date:

Project #: 11343-606-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: Arlette Johnson

QC: SPEC Del: STD TAT: 30 days

Date Rec'd: 9-6-03 Date Due: 10-6-03

	A	B	C	D	E
Refrigerator #	4	1		1	4
#/Type Container – Solid	1ag	1ag	1ag	1ag	1ag
Volume – Solid	60	250	125	60	125
Preservatives	–	–	–	–	–
Analyses Requested	Pest/PCB	Herb	Hex Chrom	NO2/NO3	Oil + Grease
Lionville Laboratory Use Only	0608H	0H3Gx	ICR6	INJN2	IOGGR

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Analyses columns: ORGANIC (VOA, BNA, Pest/PCB, Herb); INORG (Metal, CN)

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	Pest/PCB (0608H)	Herb (0H3Gx)	Hex Chrom (ICR6)	NO2/NO3 (INJN2)	Oil + Grease (IOGGR)
001	B17HR9			S	9-3-03	0841	X	X	X	X	X
002	B17HT0					0857			X	X	X
003	B17HT1					1350			X	X	X
004	B17HX4					0920	X	X	X	X	X
005	B17HX5					0930			X	X	X
006	B17HX6				9-4-03	1025			X	X	X
007	B17HX8				9-3-03	1000	X	X	X	X	X
008	B17HX9					1030	X	X	X	X	X
009	B17HY4				9-4-03	1240	X	X	X	X	X
010	B17J02				9-3-03	1000	X	X	X	X	X

Special Instructions: SAF # F03-006

Run Matrix QC

DATE/REVISIONS:
1. Did not receive volume for
2. Pest, Herb + O+G analyses for sample 010
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were: ✓
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 0.8 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed Ex	A. Smith	9-6-03	1025	"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 7914 9192 7033

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-242	Page 1 of 1

Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom / Telephone No.: 373-3928	Project Coordinator: TRENT, SJ	Price Code: 8N / Data Turnaround: 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin ~ C4113	SAF No.: F03-006	Air Quality ☐
Ice Chest No.: SEE OSR	Field Logbook No.: HNF-N-3361 / COA: 117504ES10	Method of Shipment: Federal Express	
Shipped To: EBERLINE SERVICES (Formerly TMA) RECRA	Offsite Property No.: A030 346	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A Tic To ~~Foo~~ Bi ~~Foo~~

Special Handling and/or Storage
N/A Coo 14°C

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) for Special Instructions.	Tritium - H3
				Cool 4C	aG	1	60mL							
				Cool 4C	aG	1	250mL							
				Cool 4C	aG	1	125mL							
				Cool 4C	aG	1	60mL							
				Cool 4C	aG	1	125mL							
				None	aG	1	60mL							
				None	aG	1	60mL							
B17HR9	SOIL	9-3-03	0841	X	X	X	X	X	X	X	X	X	X	X
B17HT0	SOIL	9-3-03	0857			X	X	X						
B17HT1	SOIL	9-3-03	1350			X	X	X						
~~B17HT2~~	SOIL	~~9-3-03~~ MD 9-4				X	X	X						

3-03

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	9-3-03 1500	MO-020 Ref# 1	9-3-03 1500
MO-020 Ref# 1	9-4-03 1400	[illegible]	9-4-03
[illegible]	9-4-03 1430	Ref #3C	9-4-03 1430
3C 3728	9-5-03 0900	R. Fahlberg	9-5-03
R. Fahlberg	9-5-03 1005	Fed Ex	
Fed Ex	9-6-03 1025	[illegible]	9-6-03 1025

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium {Thorium-232}; Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728
Ref # 3C on 9/5/03

Matrix *
S=Soil
SB=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
Ve=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-006-245
Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom — Telephone No.: 373-3928	Project Coordinator: TRENT, SJ	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin - C4114	SAF No.: F03-006	Air Quality: ☐
Ice Chest No.: SEE OSRC	Field Logbook No.: HNF-N-3361 — COA: 117504ES10	Method of Shipment: Federal Express	
Shipped To: TMJ 9-3-03 EBERLINE SERVICES (Formerly TMA) Recra	Offsite Property No.: A030 346	Bill of Lading/Air Bill No.: SEE OSRC	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A Tie To B17J00

Special Handling and/or Storage
N/A cool 4C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	60mL	250mL	125mL	60mL	125mL	60mL	60mL			
SAMPLE ANALYSIS	Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) & Special Instructions	Tritium - H3			

Sample No.	Matrix *	Sample Date	Sample Time									
B17HX4	SOIL	9-3-03	0920	X	X	X	X	X				
B17HX5	SOIL	9-3-03	0930		TMJ 9-3-03	X	X	X				
B17HX6	SOIL	9-4-03 TMJ 9-4-03	1025			X	X	X				
~~B17HX7~~	~~SOIL~~	~~9-3-03~~				X	X 9-4-03					
~~B17J02~~	~~SOIL~~	~~9-3-03~~				TMJ X	9-4-03 X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
TMJ	9-3-03 1500	MD-DOE REF #1	9-3-03 1500
MD-DOE REF #1	9-4-03 1400	TMJ	9-4-03 1400
TMJ	9-4-03 1430	REF #3C	9-4-03 1430
3C 3728	9.5.03 1000	R. Fahlberg	9.5.03
ERC R. Fahlberg	9.5.03 1000		
	9.6.03/1025		9.6.03/1025

SPECIAL INSTRUCTIONS
FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

(1) Technetium-99; Strontium-89,90 -- Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237

Personnel not available to relinquish samples from the 3728 Ref # 3C on 9/5/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W= Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-245
Collector: Pope/Pfister/Hughes	Company Contact: LC Hulstrom; Telephone No.: 373-3928	Project Coordinator: TRENT, SJ
Project Designation: 200-PW-2/200-PW-4 OU - Borehole Soil Sampling	Sampling Location: 200-PW-4/Retention Basin - C4115	SAF No.: F03-006
Ice Chest No.: SEE OSPC	Field Logbook No.: HNF-N-3361; COA: 117504ES10	Method of Shipment: Federal Express
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ Recra TMJ 9-4-03	Offsite Property No.: A030546	Bill of Lading/Air Bill No.: SEE OSPC

Price Code: 8N

Air Quality ☐

Data Turnaround: 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

N/A Tie to B17J00

Special Handling and/or Storage

N/A cool 4°C

				Pesticides - 8081	Chloro-Herbicides - EPA8151	Chromium Hex - 7196	NO2/NO3 - 353.2	Oil & Grease - 413.1	See item (1) in Special Instructions	Tritium - H3			
Preservation				Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	None	None			
Type of Container				aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)				1	1	1	1	1	1	1			
Volume				60mL	250mL	125mL	60mL	125mL	60mL	60mL			
Sample No.	**Matrix ***	**Sample Date**	**Sample Time**										
B17HX8	SOIL	9-3-03	1000	X	X	X	X	X					
B17HX9	SOIL	9-3-03	1030	X	X	X	X	X					
B17HY4	SOIL	9-4-03	1240	X	X	X	X	X					
~~B17HY5~~	~~SOIL~~	TMJ 9-4-03											
B17J02	Soil	9-3-03	1000	X	X	X	X	X					

(Last two analysis columns lined out: TMJ 9-4-03)

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature]	9-3-03	MO-022 Ref#1	9-3-03 1500
MO-022 Ref #1	9-4-03 1400	[signature]	9-4-03 1400
[signature]	9-4-03 1430	Ref #3C	9-4-03 1430
3C 3728	9-5-03 1000	R. Fillbay [signature]	9-5-03 1000
ERA R. Fillbay [signature]	9-5-03 1000	FedEx	
FedEx	9-6-03/1025	[signature]	9-6-03/1025

SPECIAL INSTRUCTIONS

FH acknowledges that holding times (less than 14 days) may not be met by the lab due to the radl characteristics.

~~(1) Technetium-99; Strontium-89,90 – Total Sr; Isotopic Thorium (Thorium-232); Carbon-14; Iodine-129; Nickel-63; Neptunium-237.~~ TMJ 9-4-03

Personnel not available to relinquish samples from the 3728 Ref # 3C on 9/5/03

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

IENT: TNU Hanford

chase Order/Project:

DATE: 9-6-03

F#) SOW# / Release #: FU3-006

)oratory SDG #: Q309L404

TE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	9.6.03 ~~☑ Yes~~	☑ No	☐ N/A	☑ see Comment # del Cle
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☐ Yes	☐ No	☑ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

ooler # / temp (°C) and Comments:

ERC 99-062 / 0.8°

aboratory Sample Custodian:

aboratory Project Manager: DF Smith

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	(C) circled	D	E
PROJECT: 200 Area			DATA PACKAGE:		
VALIDATOR: [illegible]	LAB: [illegible]			DATE: 11/16/03	
CASE:			SDG: H2329		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	(Oil and Grease) circled	Alkalinity
Ammonia	BOD/COD	Chloride	(Chromium-VI) circled	pH	(NO_3/NO_2) circled
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? .... (Yes) circled No N/A

Comments: Not all samples on COC were received, notification given. Insufficient volume noted on COC, however, All samples Analyzed for tests requested. [illegible] 11-23-0[illegible]

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? .... Yes No (N/A) circled

Initial calibrations acceptable? .... Yes No (N/A) circled

ICV and CCV checks performed on all instruments? .... Yes No (N/A) circled

ICV and CCV checks acceptable? .... Yes No (N/A) circled

Standards traceable? .... Yes No (N/A) circled

Standards expired? .... Yes No (N/A) circled

Calculation check acceptable? .... Yes No (N/A) circled

Comments: ____________

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No (N/A)
ICB and CCB results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No (N/A)
Field blank results acceptable? (Levels C, D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... (Yes) No N/A
Spike recoveries acceptable? ..... (Yes) No N/A
Spike standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
Spike standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes No (N/A)
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? (Yes) No N/A

Duplicate results acceptable? (Yes) No N/A

MS/MSD standards NIST traceable? (Levels D, E) Yes No (N/A)

MS/MSD standards expired? (Levels D, E) Yes No (N/A)

Field duplicate RPD values acceptable? (Yes) No N/A

Field split RPD values acceptable? Yes No (N/A)

Transcription/calculation errors? (Levels D, E) Yes No (N/A)

jpg 1/13/04

Comments:

6. HOLDING TIMES (all levels)

Samples properly preserved? (Yes) No N/A

Sample holding times acceptable? (Yes) No N/A

Comments: collected 8/25/03

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? .... (Yes) No N/A

Rresults supported in the raw data? (Levels D, E) .... Yes No (N/A)

Samples properly prepared? (Levels D, E) .... Yes No (N/A)

Detection limits meet RDL? .... (Yes) (No) N/A

Transcription/calculation errors? (Levels D, E) .... Yes No (N/A)

Comments:

O9 6 have high RL as compared TO SAP. No flags as method Blank the SAme.

MK
11-23-03